

SUPPORT FOR THE AMENDMENTS

Claim 10 is amended to correct an obvious error. Applicants note that Claim 10 of the original specification recited 40 % by weight. The typographical error was made in the Preliminary Amendment filed with the application.

No new matter is added to this application by entry of this amendment.

Claims 1-16 are active.

REMARKS/ARGUMENTS

The claimed invention is directed to a vinyl aromatic copolymer reinforced with rubbery particles and a process for the preparation thereof. A rubber reinforced vinyl aromatic copolymer having good physico-mechanical properties as indicated by gloss and impact resistance, which can be produced with standard polymer production equipment by a method which is more efficient and economical in comparison to conventional methods is sought.

The claimed invention addresses this problem by providing the rubber reinforced vinyl aromatic copolymer having a strictly bimodal morphology described in Claim 1 and claims dependent thereon which is produced by either the mass-continuous process described in Claim 9 and claims dependent thereon or the mass-suspension process described in Claim 10 and claims dependent thereon.

Applicants have surprisingly discovered that a rubber reinforced vinyl aromatic (co)polymer having a strictly bimodal morphology of reinforcing particles can be obtained by a single polymerization of vinyl aromatic monomer(s) when the rubber components are both dissolved in the monomer solution. Applicants have described the phrase “strictly bimodal morphology” beginning on page 1, line 14, and bridging to page 2, in the specification. Applicants have discovered that such morphology can be obtained if the relationship of

Hildebrand solubility parameters of the rubber elastomers of the capsule and “salami” particles satisfies the following: $\delta_1 - \delta_2 \leq 0.5$; where δ_1 the solubility parameter of the capsule rubbery particle and δ_2 is the solubility parameter of the “salami” particle (See description beginning at line 14, page 11 and continuing to line 11, page 12). No such rubber reinforced vinyl aromatic (co)polymer is disclosed or suggested in the cited references.

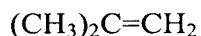
The rejection of Claims 1-3 and 7 under 35 U.S.C. 103(a) over Echte et al. (U.S. 4,493,922) as evidence by Kasahara et al. (U.S. 5039,714) is respectfully traversed.

Echte describes a thermoplastic molding material containing polystyrene as the matrix and dispersed in the matrix, two particle types differing in size and morphology (Abstract). The reference describes production of the molding material either by a blending method (Example 1) or by preparation of two prepolymer mixtures and mixing them to complete polymerization (Example 3). Nowhere does this reference disclose or suggest polymerization of a monomer solution containing both types of reinforcing particles and nowhere does this reference disclose, suggest or provide motivation that would have led one of ordinary skill in the art, at the time of the invention to the Hildebrand solubility parameter relationship described in Claim 1.

The Office has erroneously stated (Official Action dated November 28, 2008, page 3, lines 13-15):

Butyl rubber (polybutadiene), which was used in ‘922, is admitted by the applicant to have a known Hildebrand parameter of $\delta = 7.8$ (. . .) which has a minimum of 0.5.

Applicants respectfully submit that polybutadiene is not butyl rubber. Butyl rubber is defined in Hawley’s Condensed Dictionary (copy attached) as a copolymer of isobutylene (97%) and isoprene. Isobutylene is known by one of ordinary skill to have the following chemical structure:



Applicants respectfully submit that as indicated by the structure, isobutylene is a vinyl compound, not a diene, as is butadiene, and therefore the polymers thereof are significantly different. Accordingly, the disclosure of the Hildebrand relation alleged indicated by Echte is in fact incorrect.

The Office has cited Kasahara to show an equivalence of the terms “salami particles” and “cell and/or coil.” Kasahara describes a rubber-modified polystyrene composition containing dispersed particles. The elastomeric polymers may contain polydimethylsiloxane or other materials (Abstract). Nowhere does this reference disclose, suggest or provide motivation that would have led one of ordinary skill in the art, at the time of the invention to the Hildebrand solubility parameter relationship described in Claim 1. Therefore, Applicants respectfully submit that the secondary reference cannot cure the deficiency of Echte, previously described.

In view of all the above, Applicants respectfully submit that the cited combination of references cannot render the claimed invention obvious and withdrawal of the rejection of Claims 1-3 and 7 under 35 U.S.C. 103(a) over Echte et al. (U.S. 4,493,922) as evidence by Kasahara et al. (U.S. 5039,714) is respectfully requested.

The rejection of Claims 4-8 under 35 U.S.C. 103(a) over Echte and further in view of Demirors et al. (U.S. 6,545,090) is respectfully traversed.

The deficiency of Echte relative to Claims 1-3 and 7 is described above. Claims 4-8 all directly or indirectly depend from Claim 1 and therefore include the description of the Hildebrand relationship. Demirors is cited as to show the molecular weight ranges, per cent compositions and viscosity described in Claims 4-8. However, Applicants respectfully submit that this secondary reference does not disclose, suggest or provide motivation that would have led one of ordinary skill in the art, at the time of the invention to the Hildebrand solubility parameter relationship described in Claim 1. Therefore, Applicants respectfully

submit that Demirors cannot cure the deficiency of Echte, previously described.

Accordingly, Applicants respectfully submit that the cited combination of references cannot render the claimed invention obvious and withdrawal of the rejection of Claims 4-8 under 35 U.S.C. 103(a) over Echte and further in view of Demirors is respectfully requested.

The rejection of Claims 9-16 under 35 U.S.C. 103(a) over Echte further in view of Demirors is respectfully traversed.

Independent Claims 9 and 10 both recite the Hildebrand relationship described in Claim 1. The deficiency of these references with regard to this description has been described.

Applicants respectfully call the Examiner's attention to the following excerpt from the Office's own discussion of "**Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.***"

"The rationale to support a conclusion that the claim would have been obvious is that **all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.⁴³ "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."⁴⁴ **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art,**" (Federal Register, Vol. 72, No. 195, page 57529) **(Bold added)**


Applicants respectfully submit that neither cited reference discloses or suggests the Hildebrand relationship stated in Claims 9 and 10 and therefore do not disclose all the claimed elements. Accordingly, a conclusion of obviousness cannot be supported and withdrawal of the rejection of Claims 9-16 under 35 U.S.C. 103(a) over Echte further in view of Demirors is respectfully requested.

The objection to Claim 10 is obviated by appropriate amendment. The obvious error is herein corrected as suggested by the Examiner. Applicants wish to thank Examiner Salvitti for the useful suggestion. Withdrawal of the objection is respectfully requested.

Applicants respectfully submit that the above-identified application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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